*"**The ecological footprint** – the average amount of productive land and shallow sea appropriated by each person in bits and pieces from around the world for food, water, housing, energy, transportation, commerce, and waste absorption – is about one hectare (2.5 acres) in developing nations but about 9.6 hectares (24 acres) in the U.S. The (average) footprint for the total human population is 2.1 hectares (5.2 acres). For every person in the world to reach present U.S. levels of consumption with existing technology would require four more planet Earths" (E. O. Wilson, 2002).* [1]

CLONING THE EARTH

by Rod
(Cyber art by Anand)

Sobering facts

Populations and economies grow exponentially. This means that they increase naturally and steadily in proportion to their already existing size, and not merely by adding on new gains in a linear manner. The Indian population growth rate of 1.7% per year will therefore not merely add 17 million people each year, totalling1.68 billion in 2050; it will more than double its present population by that time. And the current economic growth rate of 7.5% will lead to a doubling of the economy every ten years. By 2050, the average per capita income of India will be equal to that of America today.

According to the ecological footprint formula provided by Professor Wilson, India and China alone, comprising more than one-third of the earth's human population and growing, will require 1.65 planet earths just to support their burgeoning populations' requirements of land, food, energy, and other material resources within a generation. The ecological footprints of both countries already exceed their own regional biocapacities by more than 50%, even though they are still below the global average. Both countries have so far also failed to achieve acceptable levels of human welfare, as measured by the expected lifespan of the population, educational enrollments, and GDP, according to the UNDP Human Development Index, in spite of their recent dramatic economic development. This disparity is what Manmohan Singh, the Prime Minister of India, refers to when he warns of the growing gap between the rich and the poor as a result of economic globalization, and the continuing lack of health care, education and infrastructure in rural areas where the majority of people live.

According to *The Living Planet Report 2006*[2], published by the WWF and Global Footprint Network in October 2006, humanity is already exceeding the capacity of the earth to restore the resources used and absorb the wastes created, by 25% per year; by 2050 humanity's ecological footprint is expected to exceed the earth's biocapacity by 50% - a condition known to systems analysts as "overshoot". One alarming consequence of this phenomenon that can now be documented, according to data analyzed by LPR, is that 30% of all vertebrate species have been lost since 1970 – a sure sign of overshoot and unsustainability. As biologists like E. O. Wilson have been reporting with alarm for decades, the earth is in the midst of a "major extinction event", and as humanity happily

continues to over-populate, over-consume, and over-pollute the planet, its life forms are diminishing apace and its resources are being exhausted.

Another important, highly credible, book-length research report on the state of the earth titled *Limits to Growth – the 30 Year Update* was published in 2004, the first version of which appeared in 1972 (*The Limits to Growth*) and the next in 1992 (*Beyond the Limits to Growth*). After careful consideration of the implications of the growth trends observed over the lifespan of just the most recent generation of humans on earth, the report's authors reach this poignant conclusion:

The set of possible futures includes a great variety of paths. There may be abrupt collapse; it is also possible there may be a smooth transition to sustainability. But the possible futures do not include indefinite growth in physical throughput. The only real choices are to bring the throughputs that support human activities down to sustainable levels through human choice, human technology and human organization, or to let nature force the decision through lack of food, energy, or materials, or through an increasingly unhealthy environment.[3]

For the time being, it is still possible to extend the earth's biocapacity by creating new croplands, replanting forests, restoring rivers and lakes to health, and reducing pollution; but the longer humanity delays making a concerted effort toward reducing its ecological footprint, the more difficult restoring balance becomes. LPR predicts that by 2025 a net decline in the earth's biocapacity will set in, and by 2050 the earth will only support the level of consumption and waste that pertained in the year 2000. At this point it is expected that humanity's ecological footprint, as well as the quality of life per capita, and the population as a whole, will begin to decline rapidly everywhere, to levels that pertained in 1960, unless some radical changes are made before that time in the economic growth, resource consumption, and reproductive patterns of our species.

In order to avoid the precipitous decline, and perhaps collapse, of civilization as we know it, and to move in a systematic way toward sustainable patterns of growth, the *Limits to Growth* authors recommend three fundamental objectives of necessary change to be achieved: an absolute limit in family size of two children, acceptance of a moderate standard of living, and the adoption of advanced technologies that are non-polluting and energy efficient. And these fundamental changes in economic growth and reproduction patterns must be achieved universally.

The authors of the *Living Planet Report* suggest a specific strategy that could stabilize food production and consumption at acceptable levels for all of humanity: a system of equitable allocations of ecological footprint shares between nations, regions and individuals, based either on absolute allotments, allocations in proportion to regional biocapacities, or allocations of per capita shares, with political and economic mechanisms put in place for trade between nations. They comment somewhat laconically, however, that "Developing the logic behind frameworks for reducing human demand is straightforward when compared to the challenge of implementing the process" (p. 26).

A little imagination, and some knowledge of the history of international relations since the formation of the United Nations Organization, will make it plain to anyone that implementing such a system of sharing in the context of today's disparities in production and consumption, as well as in regional environments and resources, would be enormously difficult, especially when an overall reduction to moderate levels of consumption is the goal.

The authors of *Limits to Growth* are similarly circumspect when speaking of a number of possible scenarios that can be predicted on the basis of current, observable and quantifiable patterns of growth, depending on the choices that we make or do not make in the future, and depending also on certain necessary assumptions such as "no war, no conflict, no corruption, and no mistakes." The predictions made by the science of systems dynamics regarding our possible futures cannot easily factor in the vicissitudes of human nature, however, or "provide any details about the complex political, psychological, and personal issues involved in constructing the transition." The authors of the study, nonetheless, step beyond the limits of their analytical systems methodology and call for humility, honesty, clear-headedness, compassion, and unflinching determination to tell the truth, on the part of leaders and the general public alike, in order to move collectively toward the culture and lifestyle of sustainability that they believe is still within reach, - but only if we make the right choices soon enough.

It is important to recognize the limitations of a scientific framework of understanding at the same time that we recognize the crucial importance of the understanding that such a framework provides. For example, just as it can be demonstrated that populations and economies grow exponentially, thereby causing exponential increases in resource use and pollution, it can also be demonstrated that such growth does not lead to the elimination of poverty or the equitable distribution of wealth and power. In fact, the economic system that has evolved over the past few centuries and continues in force today is characterized by "success to the successful feedback loops."

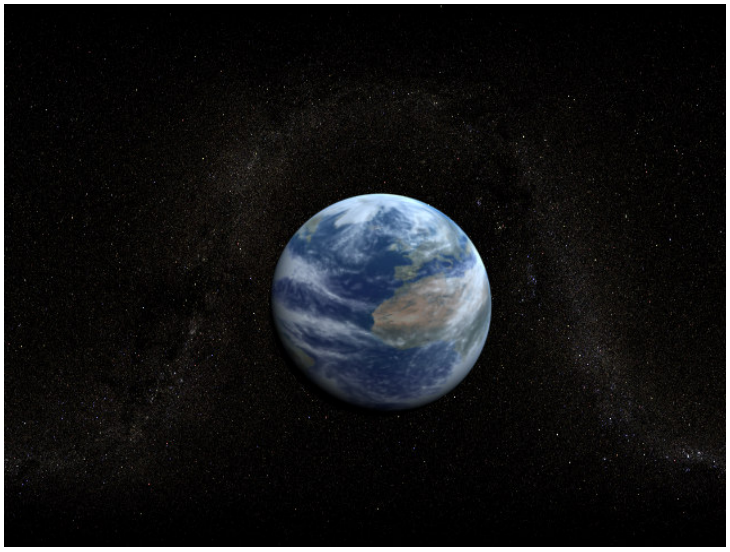
This poverty-perpetuating structure arises from the fact that it's easier for rich populations to save, invest, and multiply their capital than it is for poor ones to do so. Not only do the rich have greater power to control market conditions, purchase new technologies, and command resources, but centuries of growth have built up for them a large stock of capital that multiplies itself.[4]

It might well be argued that these principles and patterns of disparity and exploitation have been known forever; because of scientific technology the results of such natural behavior patterns are simply worse than they have ever been. And this being so, it is unlikely that humanity will now have either a sufficiently strong political will or the depth of compassion needed to change direction or stop the train. What the greatest saints and sages, particularly in India and China, have taught for millennia still has not been able to alter human nature. Now we also have the authority of Science telling us to wake up, accept the challenge of self-mastery, and rise above the unconscious forces of our habitual behavior patterns. And if we cannot do it by our will power alone, perhaps

we can use science and technology in the service of this liberating aim – and definitively alter human nature.

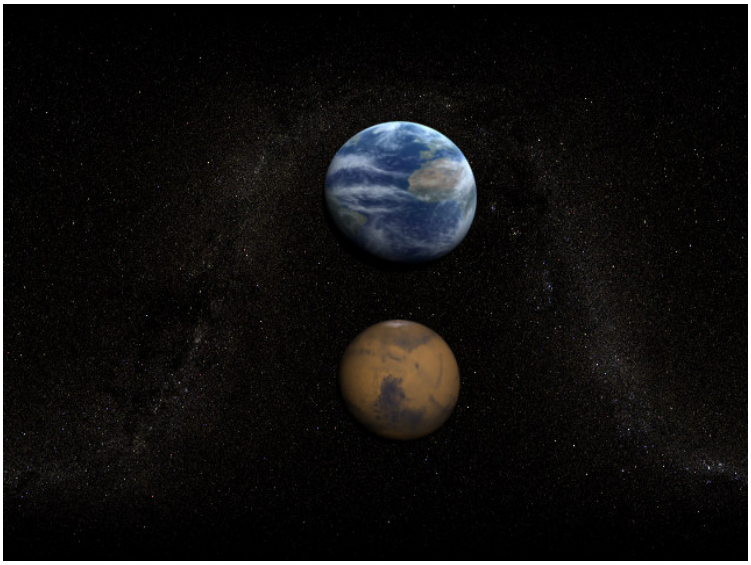
Intoxicating fictions

Let us imagine this impossible possibility: by applying the biological principles and technologies of cloning, we might actually be able to determine the destiny of our species, and of the earth as a whole. We can at least use this metaphor of a radical and unpredictable kind of change, - one that is almost within our grasp, - to help us understand the gravity of the problems we are facing today, and bring into focus the hazy demons and angels that lurk just beyond, in the twilit doorways of the future.



Alduous Huxley was the first to begin such a reflection with the novel *Brave New World* in 1931, seventy-five years ago, when the human population was only 2 billion. He foresaw many of the problems, through his faculty of creative imagination, which the sciences of demographics, ecology and systems dynamics are now able to quantify with precision. And one of the solutions he applied was the complete eradication of the process of natural insemination and birth among humans and the total control of population – quantity and quality – through genetic engineering and cloning.

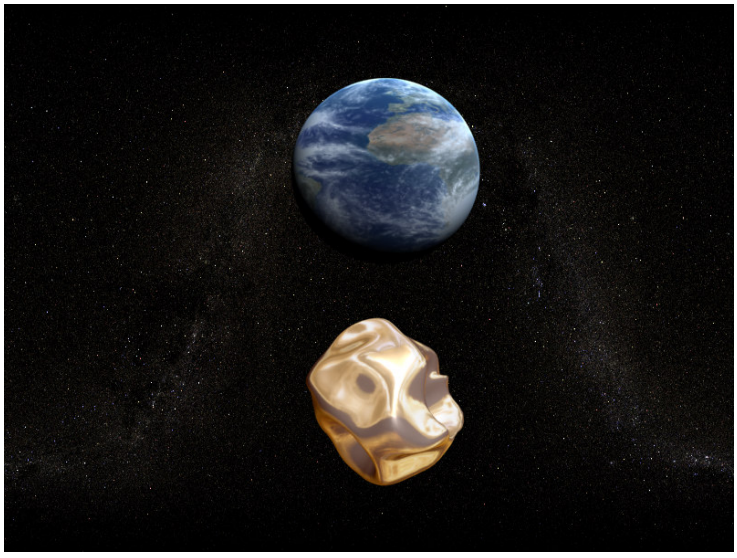
This is an option that may be possible today or tomorrow, reducing population growth radically while eliminating disease and ill health, increasing intelligence, lowering potentials for aggression and violence, and enabling a greater degree of cooperativeness and the acceptance of simpler and more harmonious standards of living on a universal scale. The flexibility of the human phenotype is such that many of these improvements in our species may be accomplished with epigenetic environmental engineering during development without interfering in the human genome. Humans would still be humans, just more perfect ones. And if, along with such species modifications, a concerted effort were also made to implement soft energy technologies in the place of fossil fuels, an efficient, harmonious, beautiful and powerful world order might be created.



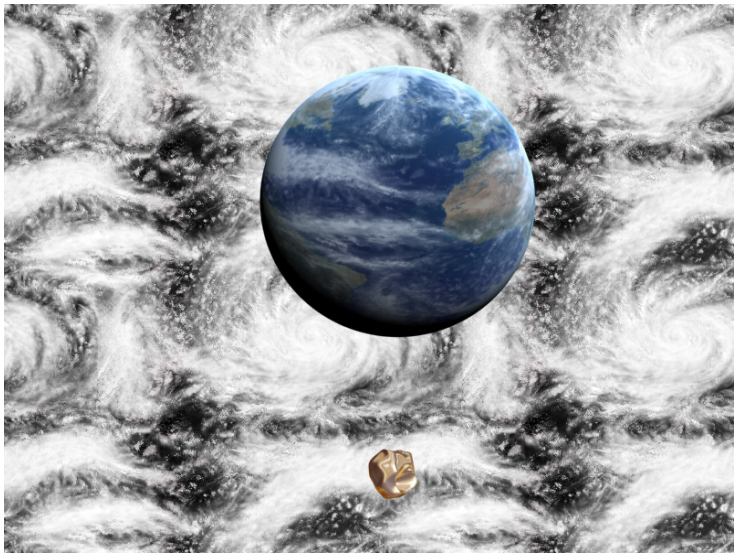
Of course this is a dream. If the will to achieve such an ideal world order is not already manifesting in humanity today, in spite of the existence of its potential – attested to by both science and the world's wisdom traditions, – under conditions of extremely

pressing need - of which large portions of humanity are now aware, - then the will to clone an earth is also not likely to manifest. But cloning an earth based on the existing model would not solve anything anyway. It would simply mean more earths facing perilous choices and impending disasters, whose characteristics have emerged from a history of ignorance and suffering.

If cloning the earth is to be the chosen solution, then it must entail genetic modifications that eliminate undesirable traits and enhance desirable ones, at least among the human species, if not throughout the biosphere as a whole: the new earth must house the best of all types of life and prepare the field for a new kind of evolutionary unfolding. If this were achieved, then traits such as efficiency, order and harmony, beauty and power, adventurousness and courage, inventiveness and erudition, along with the vast array of other culturally "stereotypical" traits, body types, psychologies, and intelligences we value, could be selected and propagated to achieve an optimal degree of species diversity and excellence. And the old earth, with its inferior types, could be allowed to simply reduce itself to an ember and disappear.

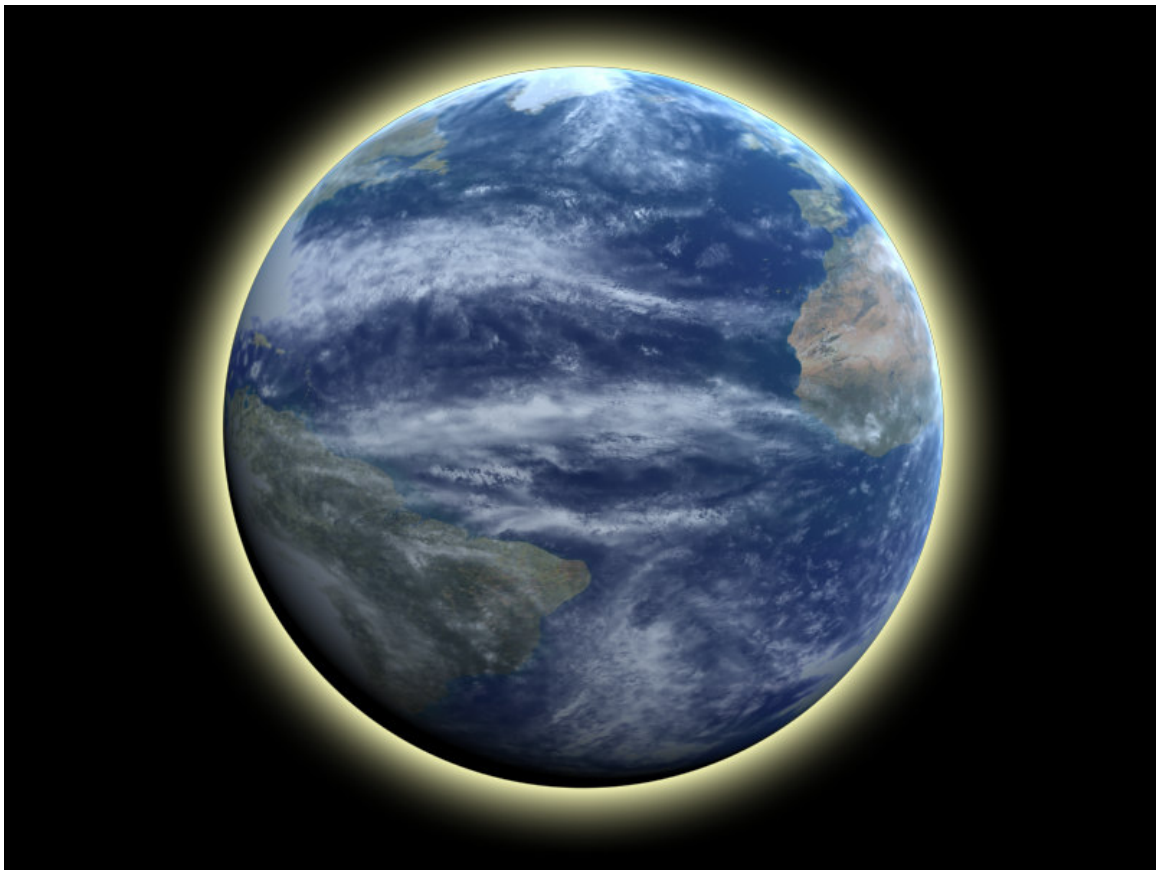


The debate on the future of cloning, in these early years of the 21st century, is heavily weighted by moralistic arguments, however, as opposed to purely scientific, technological or market driven ones. Philosophers such as Francis Fukuyama in America (*Our Posthuman Future*, 2002) and Jurgen Habermas in Germany (*The Future of Human Nature*, 2003), have championed the position that only a humanity in a natural state, that results from the evolutionary processes of natural selection, would really be human and therefore capable of understanding and realizing the principles of freedom and equality. Nature and not nurture is elevated in this way of thinking to the status of essence or divine right: since the natural processes of evolution have produced consciousness, reason, emotion, the sense of connectedness, knowledge, and morality, any attempt to improve the members of the species technologically would violate their natural rights and upset the natural hierarchy. Social and economic power makes better "right" than science.



But surely it is nurture, social conditioning, education and culture that determine our choices of ethical behavior and lifestyle – not our genetic substrate. And surely the choice to improve the chances of survival and ensure a higher level of general welfare through cloning, if this could be achieved with relative safety and certainty, would be justified in a world that would otherwise end in suffering, decline, and extinction. If the theory of evolution is correct and consciousness has evolved as a tool for survival, then our knowledge and intelligent will power must be the principles whereby we determine our choices for the future, and no longer the rudimentary principles of random variation and natural selection, brute struggle, unconscious forces and market dynamics.

There is of course no certainty that the cloning option is a viable one, but if it could be done within a relatively short period of time, and if the further complication of creating a technology for replicating the physical substrate, sufficiently similar to the mass of the earth and able to orbit this or another star, so that a newly cloned and improved biospheric culture could thrive, then a radiant new and improved (ecologically balanced and enlightened) earthlife might be able to evolve.



Cloning the earth is a thought experiment which, however fantastic, may serve to put in perspective the value of human existence on earth, its precariousness within a fragile biosphere, and the imperative of a human will to preserve the extraordinary phenomenon of conscious life as we know it. The will to liberation from suffering, love and compassion for all beings, self-sacrifice for the sake of truth, and a sense of the connectedness and oneness of all existence, which have traditionally been invoked by prophets and seers in all cultures, traditions, and periods of civilization, perhaps remains the only sure means, and the only real hope, for the future of humanity and the earth. A spiritually conscious, scientifically informed, and technologically adept species such as the one that has already evolved, may now have the ability and the responsibility to spiritually and technologically "clone" itself and its social systems into a new type of humanity that maximizes its potentials for caring, protecting, creatively re-evaluating, reorganizing, and ultimately elevating the nature of life on earth, before it is too late.

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3. *Limits to Growth - The 30 Year Update* (2004), Donella Meadows, Jorgen Randers, Dennis Meadows, Chelsea Green Publishing Co., VT, p. 13.
4. *ibid*, p. 44.